

**ABSTRACT**

Techniques for detecting fluorescence emitted by molecular constituents in a wall of a body lumen include introducing an autonomous solid support into the body lumen. Cells in a lumen wall of the body lumen are illuminated by a light source mounted to the solid support with a wavelength that excites a particular fluorescent signal. A detector mounted to the solid support detects whether illuminated cells emit the particular fluorescent signal. If the particular fluorescent signal is detected from the illuminated cells, then intensity or position in the lumen wall of the detected fluorescent signal, or both, is determined. These techniques allow the information collected by the capsule to support diagnosis and therapy of GI cancer and other intestinal pathologies and syndromes. For example, these techniques allow diagnostic imaging using endogenous and exogenous fluoroprobes, treating diseased sites by targeted release of drug with or without photoactivation, and determining therapeutic efficacy.